

REMARKS

The Examiner is thanked for the due consideration given the application. The specification has been amended to insert headings.

Claims 24-26 and 31-45 are pending in the application. Claims 38-45 have been withdrawn from consideration. Claims 27-30 have been canceled without prejudice or disclaimer by this amendment. Claim 24 has been amended to generally incorporate the subject matter of canceled claim 30. Other claim amendments improve antecedence and the language in a non-narrowing fashion.

Rejection Under 35 USC §112, Second Paragraph

Claim 30 has been rejected under 35 USC §112, second paragraph as being indefinite. This rejection is respectfully traversed.

The Official Action asserts that claim 30 refers to a canceled claim. However claim 30 has been canceled and its subject matter has been generally incorporated into claim 24 in a fashion that is clear, definite and has full antecedent basis.

This rejection is believed to be overcome, and withdrawal thereof is respectfully requested.

Art Rejections

Claims 24-29, 32, 34, 36 and 37 have been rejected under 35 USC §102(b) as being anticipated by CHEN et al. (U.S. Patent 6,187,157). Claims 30, 31 and 33 have been rejected under

35 USC §103(a) as being unpatentable over CHEN et al. Claim 35 has been rejected under 35 USC §103(a) as being unpatentable over CHEN et al. in view of HAZBUN (U.S. Patent 4,791,079).

These rejections are respectfully traversed.

First, it is noted that the incorporation of claim 30 into claim 24 instantly overcomes the anticipation over CHEN et al., because claim 30 was free of this anticipation rejection.

The present invention pertains to an oxygen conducting membrane that is a mixed conducting dense membrane of multimetal oxide.

The objective technical problem to be solved by the invention can be seen in the provision of oxygen conducting membranes that are less costly, and which reach an improved catalytic activity (high rates of conversion and selectivity) at lower operating temperatures (see page 5, line 25 to page 6, line 25 of the PCT text).

This problem is solved by using the multimetallic oxide as defined in claim 24.

None of the cited prior art teaches or infers this technology.

More specifically, CHEN et al. fail to disclose or infer a membrane formed from a multimetal oxide compound having the formula $Ba_x Sr_{1-x} Co_{1-y} Fe_y O_{3-z}$ (claim 24) having a perovskite structure (claim 26).

In contrast, CHEN et al. relates to a **multi-phase** solid electrolyte ion transport membrane comprising at least **two phases** wherein one of the phases includes an oxygen ion single conductive material or a mixed conductor. The other phase comprises an electronically-conductive metal or metal oxide that is incorporated into the membrane by deposition of a metal or metal oxide from a polymer made by polymerizing a chelated metal dispersion in a polymnerizable organic monomer or pre-polymer (see abstract). This second phase is microscopically uniformly **dispersed over** and bound onto the surface of the solid electrolyte ion transport matrix (see col. 6, lines 64-66).

The multi-phase composite material may notably be formed of a first mixed conductor phase such as a perovskite and a second phase of a metal or metal oxide distributed uniformly on the surface of the first mixed conductor phase (see col. 8, lines 62-66).

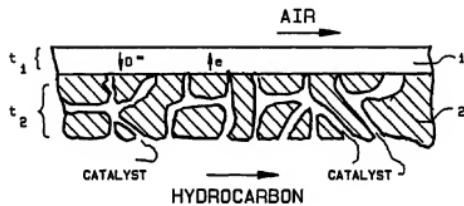
Various mixed conducting solid electrolytes are cited in table I but no mention is made of the perovskite structure defined in amended claim 24 of the present invention.

It is worth noting that the membranes disclosed in CHEN et al. are **mutli-phase composite** materials: the second phase is thus dispersed into the first phase.

Further, HAZBUN discloses a two-layer membrane in which one layer is an impervious mixed ion and electronic conducting ceramic such as yttria stabilized zirconia which is doped with

sufficient CeO₂ or titanium dioxide to impart electron conducting characteristics to the ceramic. A second layer associated with the mixed conducting impervious ceramic is a porous ion conducting layer containing a selective hydrocarbon oxidation catalyst (see col. 2, lines 57-65 and Figure 1, reproduced below).

FIGURE-1



HAZBUN only refers to a fluorite mixed conducting membrane and does not disclose or suggest to use any perovskite membrane, much less the membrane defined in amended claim 24 of the present invention.

Further, it is worth noting that the **catalyst is dispersed within this porous ion conducting layer** and is not directly in contact with the impervious mixed ion and electronic conducting ceramic.

As a result, starting from CHEN et al. the skilled person, seeking to solve the above objective technical problem, would not have been motivated to replace the dense membrane of

multimetal oxide as disclosed in CHEN et al. by the multimetal oxide having the formula $Ba_x Sr_{1-x} Co_{1-y} Fe_y O_{3-z}$ as defined in amended claim 24 of the present invention.

One or ordinary skill and creativity would thus fail to produce a claimed embodiment of the present invention from a knowledge of the applied art referentes. A *prima facie* case of unpatentability has thus not been made.

These rejections are believed to be overcome, and withdrawal thereof is respectfully requested.

Request for Rejoinder

As allowable subject matter has been indicated, rejoinder and consideration of all the claims on the merits is respectfully requested.

Conclusion

The Examiner is thanked for considering the Information Disclosure Statement filed February 27, 2006 and for making an initialed PTO-1449 Form of record in the application.

Priort art of record but not utilized is believed to be non-pertinent to the instant claims.

No issues remain. The Examiner is accordingly respectfully requested to place the application in condition for allowance and to issue a Notice of Allowability.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any

overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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